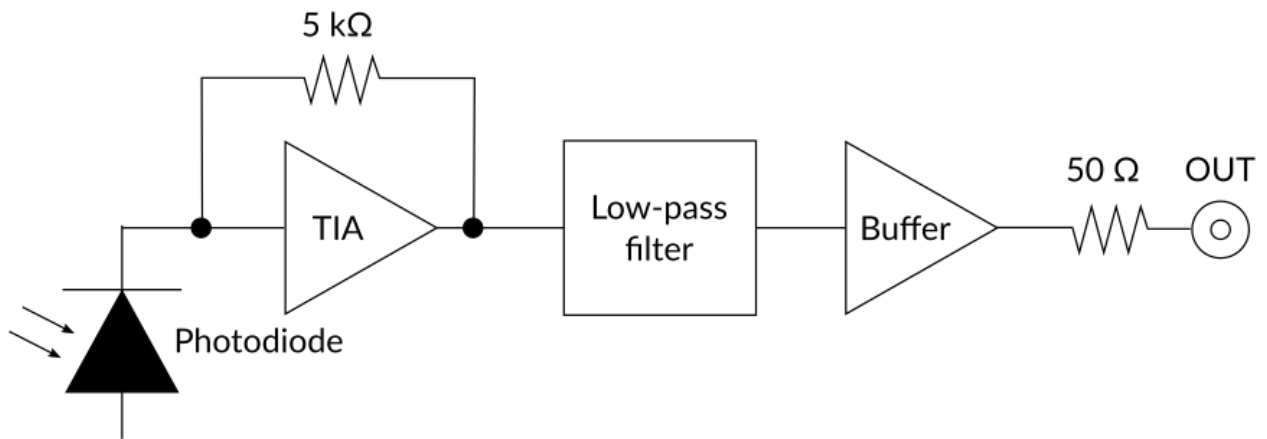


Koheron PDX10S-SI is a Si free-space photodetector with 5 kV/A transimpedance gain and 50 MHz bandwidth. With a noise-equivalent power spectral density of 4 pW/ $\sqrt{\text{Hz}}$  at 800 nm and up to 8 V DC output voltage, the PDX10S-SI is the perfect candidate for applications requiring high dynamic range.

## Specifications

|                                        | PDX10S-1M-DC-SI                               | PDX10S-5-DC-SI                                |
|----------------------------------------|-----------------------------------------------|-----------------------------------------------|
| Detector                               |                                               |                                               |
| Detector type                          | Si PIN photodiode                             | Si PIN photodiode                             |
| Photodiode active diameter             | 800 $\mu\text{m}$                             | 800 $\mu\text{m}$                             |
| Wavelength range                       | 320 nm to 1000 nm                             | 320 nm to 1000 nm                             |
| Optical input power                    | 0 $\mu\text{W}$ to 15 $\mu\text{W}$           | 0 mW to 3 mW                                  |
| Photodiode peak responsivity<br>800 nm | 0.55 A/W                                      | 0.55 A/W                                      |
| Transimpedance amplifier               |                                               |                                               |
| Small signal bandwidth                 | 0 Hz to 1 MHz at 3 dB                         | 0 Hz to 50 MHz at 3 dB                        |
| Coupling                               | DC                                            | DC                                            |
| Transimpedance gain                    | 1 MV/A                                        | 5 kV/A                                        |
| Noise Equivalent Power                 | 250 fW/ $\sqrt{\text{Hz}}$ at 10 kHz          | 4 pW/ $\sqrt{\text{Hz}}$ at 1 MHz             |
| Output impedance                       | 50 $\Omega$                                   | 50 $\Omega$                                   |
| Output voltage range                   | 0 V to 8 V                                    | 0 V to 8 V                                    |
| Output                                 | SMA female connector                          | SMA female connector                          |
| Power supplies                         |                                               |                                               |
| Positive supply voltage                | 10.5 V to 13 V                                | 10.5 V to 13 V                                |
| Negative supply voltage                | -9 V to -4 V                                  | -9 V to -4 V                                  |
| Quiescent current per rail             | 40 mA                                         | 40 mA                                         |
| Maximum current<br>positive supply     | 130 mA                                        | 130 mA                                        |
| Other                                  |                                               |                                               |
| Outside dimensions                     | 49 mm x 40 mm x 18 mm                         | 49 mm x 40 mm x 18 mm                         |
| Operating temperature                  | 0 $^{\circ}\text{C}$ to 50 $^{\circ}\text{C}$ | 0 $^{\circ}\text{C}$ to 50 $^{\circ}\text{C}$ |
| Weight                                 | 26 g                                          | 26 g                                          |

## Functional diagram

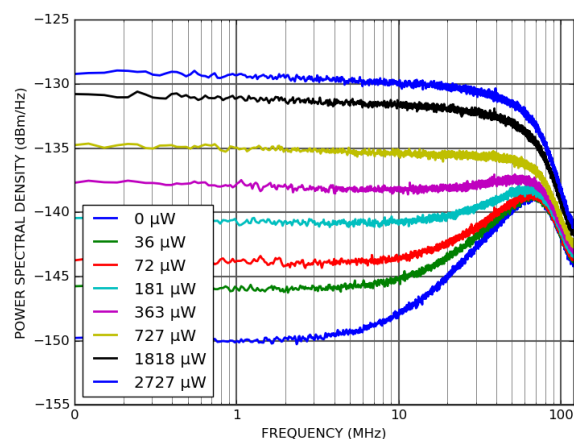


PDX10S-SI functional diagram

## Characterization

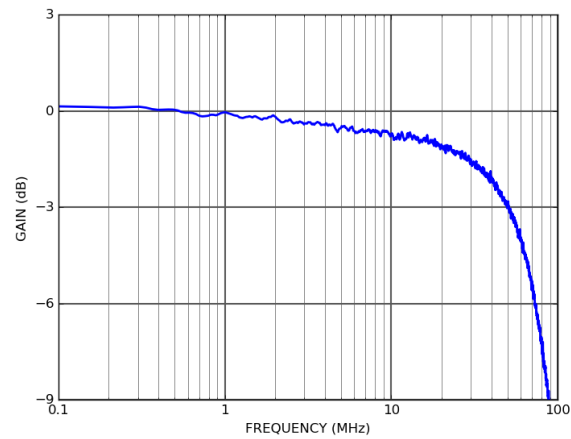
### Output power spectral density

The power spectral density of the PDX10S-5-DC-SI output was measured for different incident optical powers. Optical source is a 810 nm LED driven by a [Koheron DRV110-A-375 laser driver](#). Power spectrum is measured using the [Koheron ALPHA250](#) FFT analyzer.

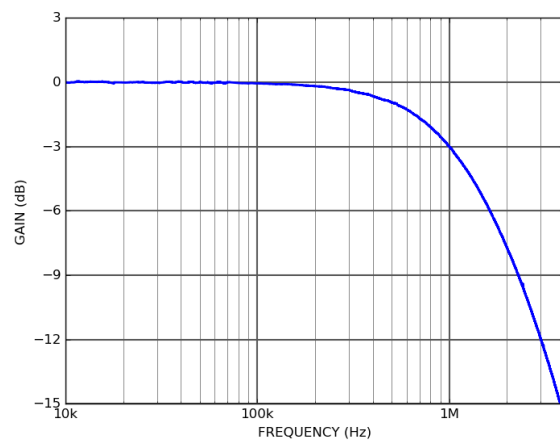


PDX10S-5-DC-SI power spectral density vs optical power

### Small signal frequency response



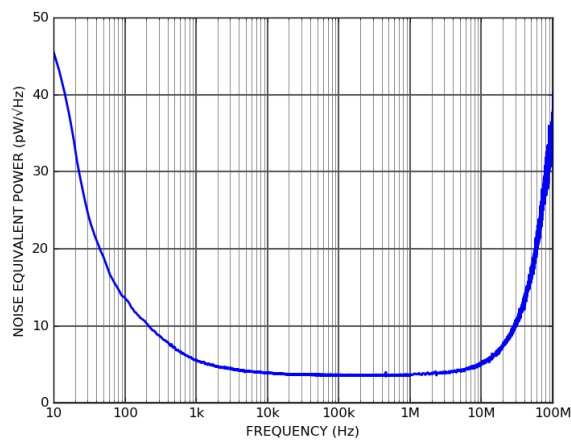
PDX10S-5-DC-SI (5 kV/A) small signal frequency response



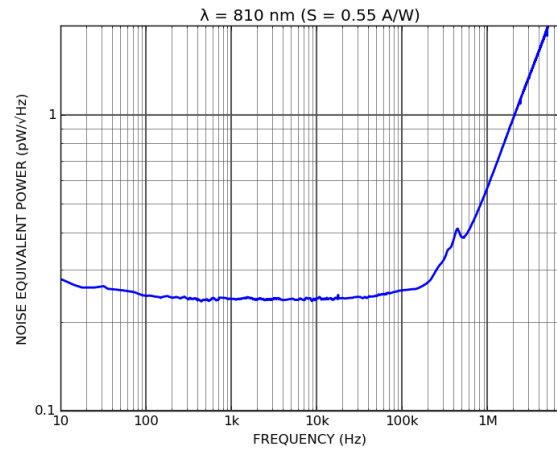
PDX10S-1M-DC-SI (1 MV/A) small signal frequency response

## Noise equivalent power

The figure below shows the noise-equivalent power spectral density at a wavelength of 810 nm.



PDX10S-5-DC-SI (5 kV/A) noise equivalent power



PDX10S-1M-DC-SI (1 MV/A) noise equivalent power

## Ordering codes

| PRODUCT NUMBER  | ATTRIBUTE                  |
|-----------------|----------------------------|
| PDX10S-5-DC-SI  | Transimpedance gain 5 kV/A |
| PDX10S-1M-DC-SI | Transimpedance gain 1 MV/A |